

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Applicant: Serge Louis Boulet et al. Group Art Unit: 1626

Serial No.: 10/597,835

Examiner:

Sun Jae Y Loewe

Application Date: February 18, 2005

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Date (if applicable): August 9, 2006

For: PHARMACEUTICAL COMPOUNDS

Docket No.: X-16288

SUBMISSION UNDER 37 C.F.R. 41.33

Commissioner for Patents

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Sir:

Applicants submit a copy of a newly discovered scientific article under 37 C.F.R. 1.97 contained herewith.

Since this submission is being filed after filing the notice of appeal and prior to filing the appeal brief under 37 C.F.R. 41.33, applicants provide

A) the article overcomes the rejection under 35 U.S.C. 103(a) under appeal; and

B) good and sufficient reasons why the article is necessary and why it was not presented earlier.

Claim Rejections under 35 USC 103(a)

In the Official Action dated April 11, 2008, the Examiner rejected Claims 1, 6, 8, 15 and 33 as obvious under 35 USC 103(a) after examination of the elected species, Example 30 in view of Cheshire *et al.*. The examiner discusses the teaching/suggestion/motivation to make changes to a specific compound disclosed Cheshire *et al.* to arrive at Applicant's elected species. In this final action, the Examiner refers to the Graham v. Deere analysis and summary presented in the office

action dated September 5, 2007:

“One of ordinary skill would be motivated to make the modification required to arrive at the instant invention with reasonable expectation of obtaining a compound that is an inhibitor of nitric oxide synthase. The motivation would be to make alternate compounds that are inhibitors of nitric oxide synthase.”

Applicants maintain the assertion that neither the claimed invention nor the elected species of Example 30 are obvious in view of Cheshire *et al.* To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. MPEP §2143.

Applicants respectively submit that one skilled in the art of medicinal chemistry of nitric oxide synthase (NOS) inhibitors with the knowledge available in Beaton, H; *et al.*; *Biorganic & Medicinal Chemistry Letters*, 11 (2001) pages 1023 – 1026 would not be motivated to start with the compound of Cheshire *et al.* to arrive at compounds of the current invention as inhibitors of nitric oxide synthase. Applicants further submit even if a skilled artisan would be motivated to start with the compound of Cheshire *et al.*, in view Beaton *et al.*, there would be no reasonable expectation that the structural modification employed would produce an inhibitor of nitric oxide synthase.

No motivation to start with the prior art compound of Cheshire *et al.* to make new inhibitors of nitric oxide synthase in view of Beaton *et al.*

Applicants assert, in view of Beaton *et al.*, there is no suggestion or motivation, to start with the 5-substituent of the phenoxypropylamines of Cheshire *et al.* to arrive at the 4-substituted compound of the elected species Example 30 as a inhibitor of nitric oxide synthase.

Beaton *et al.* teaches the desirability of compounds which are selective in inhibiting a specific NOS enzyme, the isoform iNOS. Compounds which are non-selective have demonstrated undesirable cardiovascular side effects arising from inhibition of the isoform eNOS (see page 1023). A skilled artisan seeking to make alternate compounds that are inhibitors of nitric oxide synthase would be motivated to make compounds that lack undesirable eNOS activity. Even though Cheshire *et al.* discloses certain of phenoxypropylamines which are inhibitors of nitric oxide synthase particularly iNOS, it makes no teaching as to which compounds

may or may not inhibit eNOS activity nor does it teach the desirability of compounds which lack eNOS activity. Thus, a skilled artisan seeking to make alternate compounds that are inhibitors of nitric oxide synthase would be motivated to make compounds that lack eNOS activity and would not start with the phenoxypropylamines of Cheshire *et al.* which are disclosed as inhibitors of nitric oxide synthase including the undesirable isoform eNOS.

In the quest for selective inhibitors, Beaton *et al.* further discloses a series of 3,4-dihydro-1-isoquinolinamines with a wide range of selectivity toward NOS featuring the discovery of one of the most selective inhibitors known at that time, compound **5j**. Compound **5j** is shown to be a potent inhibitor of iNOS with no significant activity toward eNOS (see pages 1023-1024). A skilled artisan seeking to make alternate compounds that are inhibitors of nitric oxide synthase would be motivated to start with a selective iNOS inhibitor such as compound **5j** of Beaton *et al.*, and not a phenoxypropylamine of Cheshire *et al.* to arrive at compounds that lack eNOS activity.

No reasonable expectation that making a positional isomer of the compound disclosed in Cheshire *et al.* would lead to an inhibitor of nitric oxide synthase

Applicants assert in view of Beaton *et al.*, even if a skilled artisan would be motivated to start with a compound of Cheshire *et al.*, there would be no reasonable expectation that making a positional isomer modification would produce an inhibitor of nitric oxide synthase.

In exploring structural variation of the 3,4-dihydro-1-isoquinolinamines, Beaton *et al.* highlights the dramatic effects of positional isomer change on the inhibition of nitric oxide synthase. In particular, making one positional isomer of a fluorine substituent, in this case from the 5 to the 6 position, has little effect in that it maintains activity, while moving the same substituent one additional position, from the 6 to the 7 position, produces a compound which is essentially inactive (see page 1024 Table 1). The following is a quotation from the Results and Discussion section on page 1024 (emphasis added):

“Whilst fluorine substitution meta or para in the phenyl substituent or at positions 5 or 6 in the isoquinoline ring can be made with little or no effect on either the potency or selectivity profile of the compounds, dramatic effects occur on substitution at the isoquinoline 7 or 8 position. While the former is almost inactive, the latter results in a 34-fold increase in iNOS activity...”

These dramatic effects demonstrate the unpredictability of positional isomer changes in the medicinal chemistry of nitric oxide synthase inhibitors. Thus, a skilled artisan seeking to make alternate compounds that are inhibitors of nitric oxide synthase would not have a reasonable expectation that making the specific positional isomer of the compound disclosed in Cheshire *et al.* would lead to an inhibitor of nitric oxide synthase.

In view of the above arguments and additional evidence, Applicants assert that the instantly claimed compounds are not obvious in view of Cheshire *et al.* under 35 U.S.C. 103(a). Applicants respectively request allowance of Claims 1, 6, 8, 15 and 33.

Necessity of Beaton *et al.* and why it was not presented earlier

Applicants respectfully submit that Beaton, H; *et al.*; *Biorganic & Medicinal Chemistry Letters*, 11 (2001) pages 1023 – 1026 is necessary to demonstrate knowledge available to one skilled in the art of medicinal chemistry of nitric oxide synthase inhibitors. Applicants further submit the article was not presented earlier because it is newly discovered.

Applicants respectfully request consideration of the submission under 37 C.F.R. 41.33 and reconsideration and withdrawal of the rejection. Allowance of Claims 1, 6, 8, 15 and 33 is kindly solicited. The Examiner is invited to contact the undersigned agent should any questions arise as a result of the submission provided herein.

Respectfully submitted,

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